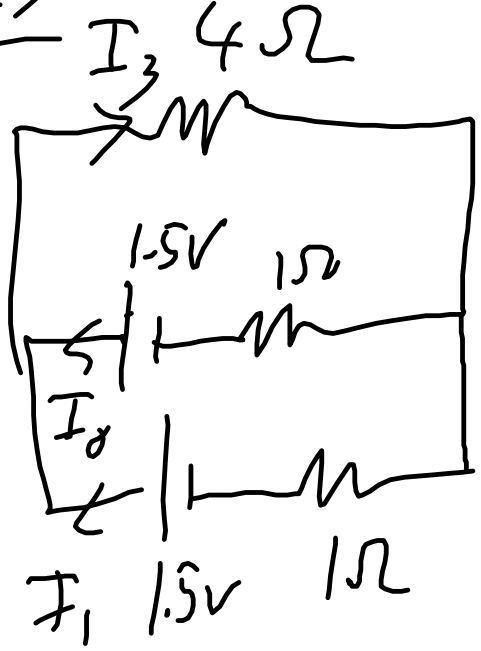
$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots$$

$$\frac{1}{R_T} = \frac{1}{R/9} + \frac{1}{R/9} + \cdots = \frac{9}{R/9}$$

$$\frac{1}{R_T} = \frac{81}{R} \qquad R_T = \frac{R}{81}$$

Bonus

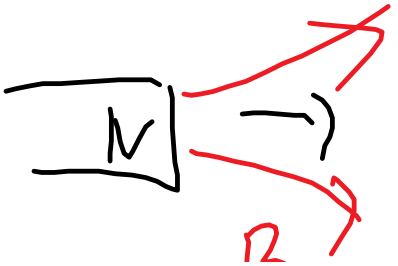


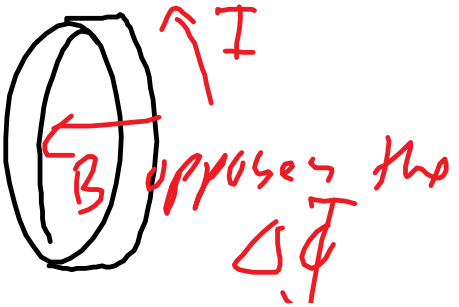
$$I_1 + I_2 = I_3$$

$$1.5V = 4I_3 + I_2$$

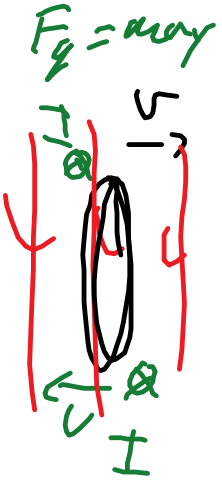
$$1.5V = 4I_3 + I_1$$

Q23

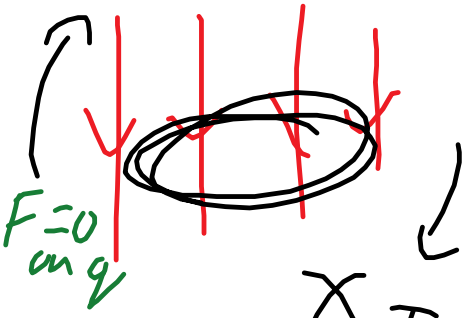




no B so induced I creating B down



Bonus:

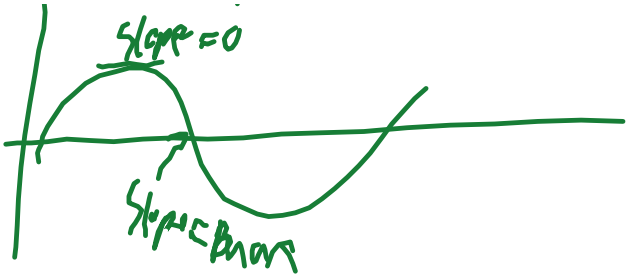


$$\mathcal{E}mf = -N\frac{\Delta\Phi}{\Delta t}$$

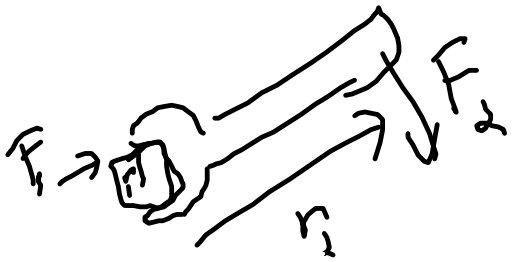
$$\Phi = \sin 2\pi f t$$

$$\frac{d\Phi}{dt} = \omega \cos \omega t$$

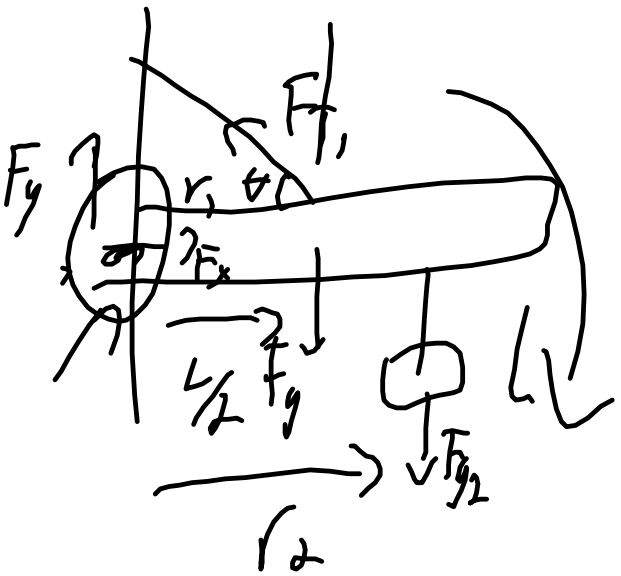
slope = 0



vectors and projectiles,
Torque $\tau = Fr\sin\theta$



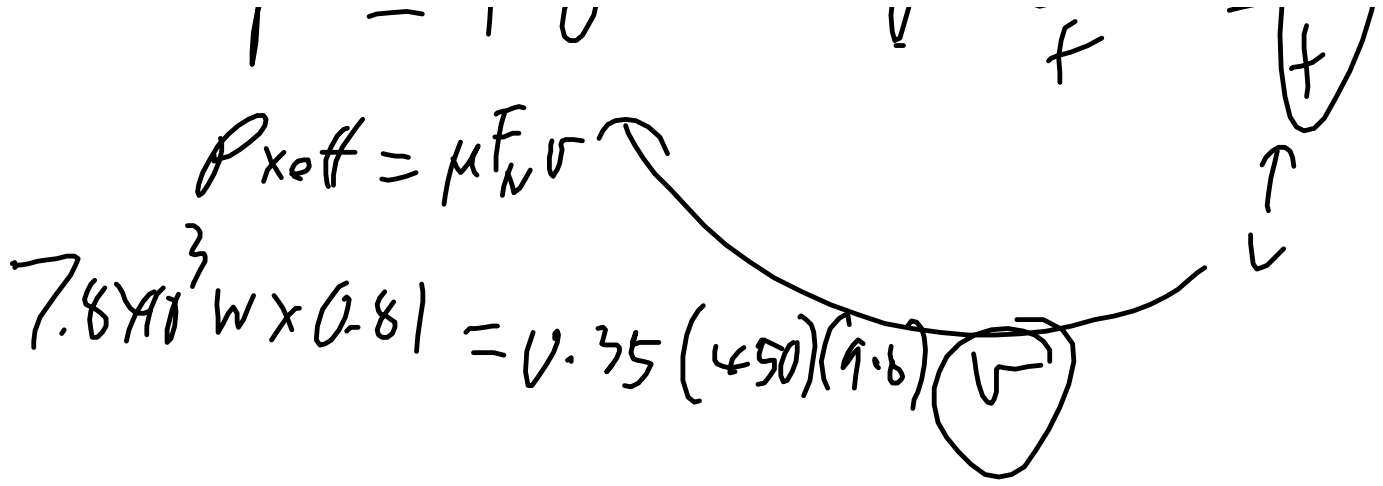
$\tau_1 = F_1 r_1$ $\quad \tau_2 = F_2 r_2$



$\sum \tau_i = \sum \tau_{ccw}$

$F_{y_2} r_2 + F_y \frac{L}{2} = F_1 r_1 \sin\theta$

$P = F v$ $\quad P = \frac{W}{t} = \frac{Fd}{t}$



$\sum F_{energy}$ is conserved

$E_{elastic} = \frac{1}{2} k x^2$

$\Delta h = L_0 + x$ $\quad E_g = mgh = \frac{1}{2} k x^2$

$F_g = mg = \frac{GMm}{r^2}$

$F_e = qE = \frac{kQq}{r^2}$

$E_g = mgh = -\frac{GMm}{r}$

$$E_e = qEd = \frac{kQq}{r}$$

Books and handouts (gravity?) back on final day.

$$F_e = F_B$$

$$E\cancel{q} = \cancel{q} vB$$

$$E = vB = \frac{V}{d}$$

$$\Delta E_e = Fd = E_g d \qquad V = \frac{E_e}{q}$$

Q18
Fb=Fg
BIL = mg
B=mg/IL = 0.0002x9.8/(1.0x0.025)=0.0784